

Affordable Unfurlable Fan-Fold Wrapable Reflector for Small and Large Apertures, Phase I

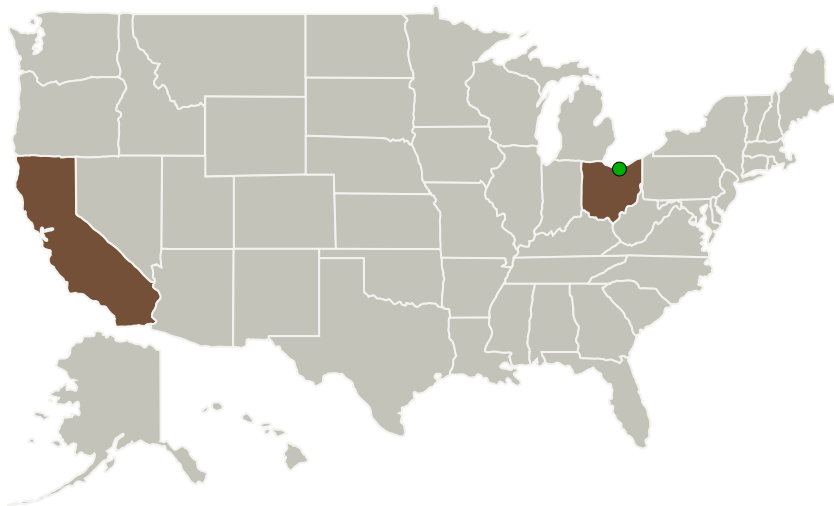
Completed Technology Project (2010 - 2010)



Project Introduction

Deployable Space Systems (DSS) will focus the proposed SBIR program on the development and concept feasibility of an innovative deployable mesh/membrane reflector that enables ultra-lightweight ($<0.32 \text{ kg/m}^2$ areal mass), affordability (modular based structure that provides high volume produce-ability), precise and repeatable surface accuracy (L, X, Ku & Ka band capable), mechanical and structural simplicity (low parts count), high deployment reliability (relies on proven flight heritage deployment mechanization), high stiffness, compact stowage volume ($> 53:1$ compaction ratio), scalable to small and very large apertures (up to 50m+ diameter with innovative packaging), and functional deployment capability within a 1G earth gravitational field without requiring an offloader (can also deploy on Mars/Lunar surfaces without an offloader). The proposed reflector technology is most suitable for offset architectures, and can also accommodate central feeds. The proposed reflector technology promises affordability and greater performance (lower mass, more compact stowage, larger aperture, and higher deployment reliability) when compared to the current start-of-the-art systems. The proposed SBIR Phase 1 and Phase 2 programs plan to advanced TRL through higher-fidelity hardware and ever-increasing test relevance. In partnership with commercial infusion partners DSS plans to rapidly ready this technology for infusion into NASA and non-NASA programs.

Primary U.S. Work Locations and Key Partners



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| Organizations Performing Work | Role | Type | Location |
|------------------------------------|-------------------------|-------------|--------------------|
| Deployable Space Systems, Inc(DSS) | Lead Organization | Industry | Goleta, California |
| ● Glenn Research Center(GRC) | Supporting Organization | NASA Center | Cleveland, Ohio |

| Primary U.S. Work Locations | |
|-----------------------------|------|
| California | Ohio |

Project Transitions

▶ **January 2010:** Project Start

✓ **July 2010:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138805>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Deployable Space Systems, Inc (DSS)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

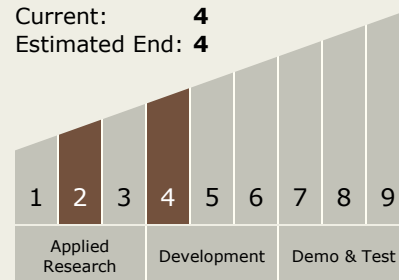
Brian R Spence

Technology Maturity (TRL)

Start: 2

Current: 4

Estimated End: 4



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Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
 - └ TX05.2 Radio Frequency
 - └ TX05.2.6 Innovative Antennas

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System